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Indian Standard

BASIC REQUIREMENTS FOR
EQUIPMENT FOR DETERMINING MOISTURE
CONTENT IN FOUNDRY SAND

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BASIC REQUIREMENTS FOR EQUIPMENT FOR DETERMINING MOISTURE CONTENT IN FOUNDRY SAND

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BASIC REQUIREMENTS FOR EQUIPMENT FOR DETERMINING MOISTURE CONTENT IN FOUNDRY SAND

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 December 1981, after the draft finalized by the Foundry Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Moisture content in sand mix is one of the most important parameters affecting the characteristics of mould or core and consequently the quality of casting produced. Its accurate determination and control is, therefore, of utmost importance for a foundry, producing quality castings. This standard has been prepared with a view to assist mainly the small scale industries, producing foundry testing equipments.

0.3 Details of the test procedure shall be in accordance with IS : 1918-1966*.

1. SCOPE

1.1 This standard covers the basic requirements for apparatus for determining moisture content in foundry sand.

2. BASIC REQUIREMENTS OF EQUIPMENT

2.0 There are mainly two types of equipments commonly used for determining moisture content in foundry sand.

2.1 Type 1 — In this type the sand sample is heated in an oven or under an infra-red lamp or by using forced hot air to find the loss in mass. The effective temperature on sample shall be between 105 to 110°C.

*Methods of physical tests for foundry sands.

2.1.1 Accuracy of result in this method depends on the sensitivity of the weighing balance. The sensitivity of the balance used for this process shall, therefore, be within ± 0.02 g.

2.2 Type 2 — In this type an active chemical reagent like calcium carbide is allowed to get mixed with sand sample and the pressure of acetylene gas generated by chemical reaction between moisture and calcium carbide is read directly on a dial graduated in percentage moisture content. In this type of apparatus the accuracy of reading depends on the following factors:

- a) Design of instrument itself, including arrangement for shaking, clamping, calibration of dial, etc;
- b) Quality of reagent used;
- c) Grain fineness of sand;
- d) Extent of mixing of sand sample; and
- e) Sensitivity of the balance (0.05 g).

2.2.1 This type of apparatus can not be expected to give very high accuracy of results. It is, therefore, recommended for shop floor control for rapid determination of moisture. The general requirements for this type of instrument shall be as follows:

- a) The graduations on the dial shall be in a position to read moisture as low as 0.10 percent. The dial shall be properly calibrated by the manufacturer and calibrations checked on each individual instrument before it is supplied.
- b) Reagent for example calcium carbide shall be of laboratory grade of high purity and shall be fresh.
- c) As the results may vary with fineness of sand grains, the method may be used for comparing the moisture content of sand samples having same grain fineness number.
- d) Mixing cycle for preparing sand sample may be first established and maintained when the results of different samples are to be compared.
- e) Sensitivity of the weighing balance provided with the instrument shall be within ± 0.05 g.
- f) When compared with direct method of determination of moisture content (*see* Type 1) accuracy shown by this apparatus shall be within ± 0.10 percent.